Air Quality Permitting
Technical Memorandum

March 6, 2003

Tier II Operating Permit and Permit to Construct No. 027-00084

Interstate Group LLC, Nampa

Project No. T2-010717

Prepared by:

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FINAL PERMIT

TABLE OF CONTENTS

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE 3

1. PURPOSE 4

2. PROJECT DESCRIPTION 4

3. SUMMARY OF EVENTS 4

4. GENERAL FACILITY PROCESS DESCRIPTION 4

5. TECHNICAL ANALYSIS 5

6. TIER II FEES 11

7. RECOMMENDATIONS 11

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
Btu	British thermal unit
CFR	Code of Federal Regulations
CO	carbon monoxide
Cr	chromium
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EPA	Environmental Protection Agency
gr	grain (1 lb = 7,000 grains)
HAP	Hazardous Air Pollutants
HVLP	High-volume, low-pressure
IDAPA	A numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometer
lb/day	pounds per day
lb/hr (	pounds per hour
lb/mo	pounds per month
lb/MMscf	pounds per million standard cubic feet
MACT	Maximum Available Control Technology
MMBtu	million British thermal units
Mn	manganese
MSDS	Material Safety Data Sheet
NAAQS	National Ambient Air Quality Standard
NESHAP	Nation Emission Standards for Hazardous Air Pollutants
NG	natural gas
Ni	nickel
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
O&M	operations and maintenance (manual)
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	prevention of significant deterioration
PTC	permit to construct
PTE	potential to emit
SIP	State Implementation Plan
SM	Synthetic Minor
SO_2	sulfur dioxide
T/yr	tons per year
T/mo	tons per month
TAP	toxic air pollutant
$\mu g/m^3$	micrograms per cubic meter
VOC	volatile organic compound

1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01 Sections 200 - 214 and 400 - 406, *Rules for the Control of Air Pollution in Idaho,* for permits to construct (PTCs) and Tier II operating permits.

2. PROJECT DESCRIPTION

This project is for a new Tier II operating permit and PTC for the Interstate Group facility located in Nampa.

3. SUMMARY OF EVENTS

The Department of Environmental (DEQ) received an application for a Tier II operating permit from the Interstate Group.

February 28, 2002	Application received
May 23, 2002	Application determined complete
October 23, 2002	Additional information received
December 9,2002	A Facility draft Tier II/PTC was issued. No comments were received.
February 2-March 3, 2002	Public comment period was held. No comments were received.

3.1 PERMITTING HISTORY

This facility has no previous air quality permits.

4. GENERAL FACILITY PROCESS DESCRIPTION

The emissions sources of the facility are:

- Trailer welding
- Xylene washing
- Applying paint in a paint booth
- Applying undercoats, sealants, and adhesives

The Interstate Group Nampa facility manufactures over-the-road transport trailers of various sizes. Constructing the trailer frames involves welding the frame channel rails and completing the skeletal structure of the trailer using bent and straight steel tubes. Following completion of the frames, the trailer box structure is attached to premanufactured axles and wheels. The trailer is then washed, dried, and wired for lighting. In this step, the trailers are wiped down with xylene to prepare the metal surfaces to be painted. The next step in the process is to apply paint-finishing materials to the sheet metal box shell in the paint booth. After painting, the wiring is completed. Plywood is then installed for interior and floor surfaces. The outside of the trailer is covered with the prefinished sheet metal and the final trim and accessories are installed. The finished product is a completed trailer ready for sale to trailer dealers.

4.1 FACILITY CLASSIFICATION

The facility is not a designated facility as defined in IDAPA 58.01.01.006.27. The AIRS Facility Subsystem classification is Synthetic Minor (SM) because the potential, uncontrolled, single hazardous air pollutant (HAP) emissions are 35 T/yr and the potential, uncontrolled, combined HAP emissions are 65 tons per year (T/yr). The facility is not subject to Prevention of Significant Deterioration (PSD) permitting requirements for a major modification because the facility's Potential to Emit (PTE) is less than 250 T/yr. This facility is a cargo trailer assembly and finishing facility, Standard Industrial Classification 3715.

4.2 AREA CLASSIFICATION

The Interstate Group Nampa facility is located in Air Quality Control Region (AQCR) 64 in Canyon County, Idaho. The area is classified as unclassifiable for all federal and state criteria air pollutants. There are no Class I areas within 10 km of the facility.

5. TECHNICAL ANALYSIS

5.1 EMISSIONS ESTIMATES

The facility's PTE estimate for Volatile Organic Compounds (VOCs) was 29.7 pounds per hour (lb/hr) and 29.7 T/yr. The PTE was based on the facility's maximum actual hourly usage. For operational flexibility, the permit allows 120% of the requested amount, which is 35.6 lb/hr (scaled up to 6,170 pounds per month (lbs/mo), based on a 40 hour week, 52 weeks per year) and 35.6 T/yr. The corresponding increase in HAPs is 9.88 lb/hr and the corresponding increase in xylene is 9.88 T/yr. Other HAPs are not specifically limited because they are emitted at levels well below the 10 T/yr major source trigger level. Toxic Air Pollutants (TAPs) are not limited because the levels emitted are below the screening level in IDAPA 58.01.01.585 and are inherently limited by the VOC limits.

Table 5.1. POTENTIAL TO EMIT

Interstate Group, LLC Nampa Potential Emissions[a] – Hourly (lb/hr) and Annual (T/yr)														
Source Description	**PM/PM_{10}**		**NO_x**		**CO**		**SO_2**		**VOC**		**Single HAP**		**Total HAPs**	
	lb/hr	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**
Welding operations	0.076	0.33											0.005	0.022
Paints, coatings, adhesives, and solvents (facility-wide)									2.97	35.6	0.830	9.88	1.5	18.0
Paints and coatings in paint booth (particulate emissions)	0.9	1.1												
Undercoat application (particulate emissions)	0.49	2.1												
Air makeup unit; 1.33 MMBtu, direct-fired natural gas	0.01	0.04	0.13	0.57	0.11	0.47	0.0008	0.004	0.007	0.03			0.0041	0.018
Total	1.476	3.57	0.13	0.57	0.11	0.47	0.0008	0.004	2.977	35.63	0.830	9.88	1.51	18.0

[a] As determined by a pollutant-specific EPA reference method, a DEQ-approved alternative, or as determined by DEQ's emissions estimation methods used in this permit analysis.

Interstate Group LLC, Nampa
Potential Emissions[a] – Hourly (lb/hr) and Annual (T/yr)

Source Description	Cr		Mn		Ni		Ethyl benzene		Ethylene glycol		Hexane	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Welding operations	1.46E-5	6.4E-5	5E-3	2.2E-2	1.46E-5	6.4E-5						
Paints, coatings, adhesives, solvents, and fugitives (facility-wide)							1.86	8.15	0.12	0.53	0.01	0.04
Air makeup unit; 1.33 million British thermal unit (MMBtu), direct-fired, natural gas											0.0039	0.017
Total	1.46E-5	6.4E-5	5E-3	2.2E-2	1.46E-5	6.4E-5	1.86	8.15	0.12	0.53	0.0139	0.057

[a] As determined by a pollutant-specific EPA reference method, a DEQ-approved alternative, or as determined by DEQ's emissions estimation methods used in this permit analysis.

Interstate Group LLC, Nampa
Potential Emissions[a] – Hourly (lb/hr) and Annual (T/yr)

Source Description	Toluene		Xylene		Formaldehyde		Methylene diphenyl Isocyanate		n-Butyl alcohol	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Paints, coatings, adhesives, solvents, and fugitives (facility-wide)	4.8	9.88	8.23	9.88			0.014	0.06	0.01	0.04
Air makeup unit; 1.33 MMBtu, direct-fired, natural gas					0.0002	0.0009				
Total	4.8	9.88	8.23	9.88	0.0002	0.0009	0.014	0.06	0.01	0.04

[a] As determined by a pollutant-specific EPA reference method, a DEQ-approved alternative, or as determined by DEQ's emissions estimation methods used in this permit analysis.

The potential emissions for the natural gas-fired 1.33 MMBtu air makeup unit were calculated using AP-42 factors for natural gas combustion, Tables 1.4-1 and 1.4-2. The factors are as follows:

Particulate Matter (PM) Total:	7.6 pounds per million standard cubic feet (lb/MMscf)
VOC	5.5 lb/MMscf
Sulfur dioxide (SO_2)	0.6 lb/MMscf
Oxides of nitrogen (NO_x)	100 lb/MMscf
Carbon monoxide (CO)	84 lb/MMscf

A sample calculation is as follows:

1.33 MMBtu/hr x 1 scf NG/1,050 Btu* x 7.6 lb PM/MMscf = 0.01 lb PM/hr
*AP-42

The PM and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometer (PM_{10}) emissions limits for the paint booth are based on the maximum estimated paint usage given in the application, the solids content, the transfer efficiency, and the paint-removal efficiency estimated by the facility. This is a conservative estimate, as the paint booth manufacturer specification state that the paint-removal efficiency is 98% and the facility used 85% in its application.

The undercoat spray paint operation is conducted in a three-sided building using an airless sprayer. The transfer efficiency of the equipment was estimated at 75% for airless spray coating application on a flat surface (*Emission Factor to Estimate Transfer Efficiency*, South Coast Air Quality Management District, http://www.aqmd.gov/permit/te.html). To determine whether the process weight rate rule, IDAPA 58.01.01.700, applies to this operation, a particulate emission estimation was done as follows: from Table 2.1.3-3 of *Fugitive Dust Control Technology* (J. A. Orlemann, Noyes Data Corporation, Park Ridge, New Jersey, U.S.A., 1983), the control efficiency for particulate of the three-sided building can be estimated at 70%. The maximum spray rate for the undercoat operation was estimated by the facility at 1.75 gallons per hour. The density is 7.47 pounds per gallon. The total application rate is 13.1 lb/hr. According to the Material Safety Data Sheet (MSDS) for the frame paint, 50% by weight of the paint is VOC. Conservatively assuming that the other 50% is solids, the application rate of solids is 13.1 lb/hr x 50% = 6.5 lb/hr.

6.5 lb/hr x (1-75% transfer efficiency) x (1- 70% control with partial enclosure) = 0.49 lb/hr particulate emissions

Because this is less than 1 lb/hr particulate emissions, the Process Weight rate rule does not apply. Since this is a maximum paint application, the facility is not required to track paint use to demonstrate compliance with Process Weight rule. However, the undercoat paint application must be conducted inside at least a three-sided building in order to ensure the partial-enclosure control efficiency.

Emissions from welding operations were estimated by the facility.

5.2 MODELING

Modeling indicates that operation of the facility as described in the permit application will not cause or significantly contribute to a violation of an applicable National Ambient Air Quality Standard (AAQS).

Table 5.2. FULL IMPACT ANALYSIS FOR CRITERIA POLLUTANTS

Pollutant	Averaging Period	Ambient Concentration ($\mu g/m^3$)[a]	Background Concentration ($\mu g/m^3$)	Total Ambient Concentration ($\mu g/m^3$)	Regulatory Limit[b] ($\mu g/m^3$)	Compliant (Y or N)
NO_2	Annual	0.35	40.0	40.35	100	Y
SO_2	3-hour	0.03	374	37.43	1,300	Y
	24-hour	0.013	120	120.013	365	Y
CO	1-hour	3.7	11,450	11,453.7	40,000	Y
PM_{10}	24-hour	13.3	103	116	150	Y
	Annual	2.7	34	36.7	50	Y

[a] Micrograms per cubic meter
[b] IDAPA 58.01.01.577

5.2.1 Toxics

Table 5.1 shows the potential emissions of each TAP. The HAPs are limited because the PTE without permit limits would be above the major source threshold. The modeling review memorandum dated August 7, 2002, states that DEQ determined the magnitude and nature of TAP emissions and VOC emissions adequately demonstrated compliance with IDAPA 58.01.01.161.

5.3 REGULATORY REVIEW

5.3.1. Scope

This combined SM Tier II and PTC permit is being issued to limit the PTE of HAPs below major source thresholds.

5.3.2. Facility-wide Conditions

The 1.33 MMBtu air makeup unit is operated on natural gas and is regulated by facility-wide conditions.

No monitoring of the air makeup unit's emissions is required, because at the maximum rate of operation the calculated PM does not exceed the grain-loading limit specified in IDAPA 58.01.01. 677. Determined as follows:

1.33 MMBtu/hr x 1 scf NG/1,050 Btu* x 7.6 lbs PM*/1 MMscf NG x 1/16,800 acfm x
1 hour/60 min x 7,000 gr/1 lb = 6.7 E-5 gr/acf
*AP-42

This level of emissions is significantly lower than the regulatory limit of 0.015 grains per dry standard cubic foot (gr/dscf). The conversion from actual to dry standard cubic feet is unlikely to result in a difference that would result in the standard being exceeded.

The emissions from the air makeup unit are exhausted through the same stack as the paint booth particulate emissions.

5.3.3. Paint, coatings, adhesives, and cleaners

The process weight rate in IDAPA 58.01.01.702 applies to the paint booth, but is not specifically regulated by this permit because calculation shows that the PM emissions are less than 1 lb/hr. So the regulatory limit will not be exceeded as long as the filter system in the spray booth is properly maintained.

5.3.3.1 Emissions Limit – (Permit Condition 3.3.1)

The VOCs were limited to 2.97 tons per month (T/mo) and 35.6 T/yr. These limits are based on 120% of the facility's requested VOC emissions rate. The emissions rate was increased 20% from the amount in the application to allow operational flexibility.

Compliance Demonstration

The permittee is required to maintain daily records for coatings used at the facility. The records shall contain, among other items, paint name and VOC percent by weight. The permittee is required to calculate the total monthly and total annual emissions (12-month rolling average) of VOCs for all paints, adhesives, solvents, and other chemicals used at the facility. The VOCs must be calculated using the following equation:

$$VOC = \sum_{i=1}^{n} (X_i \times Y_i)$$

Where:

VOC	=	Emissions of VOC per month and/or year (lb/mo, T/yr)
n	=	Number of compounds used
X_i	=	Usage of compound i per month and/or year (lb/mo, T/yr)
Y_i	=	Weight percent of VOC contained in compound i

Spelled out, the VOC emissions are calculated as follows:

- Determine from records the amount of paint used for the month (or year).
- Calculate the pounds of paint used by multiplying the gallons used (per month or per year) by the VOC (sometimes called "volatile") pounds-per-gallon value from the MSDS or manufacturer specification sheet. In some cases, the compound is 100% volatiles. In this case, multiply the gallons used by the pound-per-gallon value to obtain the VOC emission. In some cases, the specific gravity will be stated and can be used to obtain the pound-per-gallon value of the paint by multiplying

the density of water by the specific gravity of the paint. The result is the VOC emission, in pounds, for a single type of paint.

- Repeat this procedure for each type of paint, adhesive, solvent, or other chemical used at the facility.
- Add the pounds of VOC from all sources to obtain a total VOC emission value.

5.3.3.2 Emissions Limit – (Permit Condition 3.3.2)

Total HAP emissions were limited to 1.50 T/mo and 18.0 T/yr. These limits are based on 120% of the facility's requested total HAP emissions rate. The emission rate was increased 20% from the amount in the application to allow operational flexibility. The facility-wide PTE for total HAPs is 65.7 T/yr (based on current paint formulations), so a total HAP emissions limit less than 25 T/yr was required to allow the issuance of a SM operating permit.

Compliance Demonstration

The permittee is required to maintain daily records for coatings used at the facility. The records shall contain, among other items, paint name and HAP percent by weight. The permittee is required to calculate the total monthly emissions of HAPs for all paints, adhesives, solvents, and other chemicals used at the facility. The HAPs must be calculated using the following equation:

$$HAP = \sum_{i=1}^{n} (X_i \times Y_i)$$

Where:

HAP	=	Emissions of HAP per month and/or year (lb/mo, T/yr)
n	=	Number of compounds used
X_i	=	Usage of compound i per month and/or year (lb/mo, T/yr)
Y_i	=	Weight percent of HAP contained in compound i

Spelled out, the HAP emissions are calculated as follows:

- Determine from records the amount of paint used for the month (or year).
- Calculate the pounds of paint used by multiplying the gallons used (per month or per year) by the HAP pounds-per-gallon value from the MSDS or manufacturer specification sheet for each HAP. In some cases, the HAPs are listed by weight percent. In this case, multiply the gallons used by the pound-per-gallon value to obtain the total weight, then multiply by each HAP's percent by weight to find each HAP emission. In some cases, the specific gravity will be stated and can be used to obtain the pound-per-gallon value of the paint by multiplying the specific gravity by the density of water. The result is HAP emissions, in pounds, for a single type of paint.
- Repeat this procedure for each type of paint, adhesive, solvent, or other chemical used at the facility.
- Add the pounds of each HAP from all sources to obtain a total emission value for each HAP. Then add all HAP emissions to obtain a total HAP emission value.

5.3.3.3 Emissions Limit - (Permit Condition 3.3.3)

Total emissions of any one HAP are limited to 0.83 T/mo or 9.88 tons per any consecutive 12-month period. These limits were written to maintain HAP emission levels below the major source threshold and allow a SM operating permit to be issued. The annual limit was derived based on the highest-emitting HAP, xylene, at the requested rate plus 20%. The monthly value was derived by dividing the annual limit by 12 (0.8233...) and rounding up to 0.83 T/mo.

Compliance Demonstration

The compliance demonstration for emissions of any one HAP is similar to the compliance demonstration for the emissions of total HAPs. The emissions of each HAP are calculated and totaled to show compliance monthly and annually.

5.3.3.4 Emissions Limit - (Permit Condition 3.3.4)

The PM and PM_{10} emissions from the paint booth are limited to 11 lb/day or 1.1 tons per any consecutive 12-month period. The permitted limit is based on 120% (operational flexibility) of the level stated in the permit application. The estimated emissions were based on paint application using an high-volume, low-pressure (HVLP) spray gun and an 85% efficient paint-booth filter. The 85% was based on an engineering estimate of PM_{10} filter efficiency made by the facility's contractor, URS. This estimate is conservative, as the spray-booth paint-arrestor performance test specifications show an average paint-removal efficiency of 98%.

Compliance Demonstration

The painting operations using the HVLP spray gun are conducted inside the paint booth. The permittee is required to maintain a filter system with a minimum paint-removal efficiency of 85% to control particulate generated at the paint booth. The paint-removal efficiency is estimated to represent the solids-removal efficiency. The paint-removal efficiency on the spray-booth paint- arrestor performance test specification sheet is 98%, so 85% is a conservative estimate of particulate removal. The pressure drop across the filter system must be maintained within manufacturer and Operations and Maintenance (O&M) manual specifications. The permittee is required to develop an O&M manual within 60 days of the issuance of this permit. The permittee is required to track the usage of paints and calculate the particulate emissions daily to show compliance with the daily limit.

5.4 NEW SOURCE PERFORMANCE STANDARDS (NSPS) APPLICABILITY

40 CFR Part 60 does not apply to the Interstate Group. Trailer manufacturing is not one of the listed subparts.

5.5 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS) APPLICABILITY

None of the categories listed in 40 CFR 61 or 63 apply to the Interstate Group.

5.6 COMPLIANCE ISSUES

The facility failed to obtain a PTC prior to construction. The proposed solution is to obtain a PTC and a Tier II operating permit simultaneously.

5.7 AIRS

Table 5.3. AIRS/AFS FACILITY-WIDE CLASSIFICATION DATA ENTRY FORM

AIR PROGRAM / POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	TITLE V	AREA CLASSIFICATION A – Attainment U – Unclassifiable N – Nonattainment
SO_2	B						U
NO_x	B						U
CO	B						U
PM_{10}	B						U
PT (Particulate)	B						U
VOC	B						U
THAP (Total HAPs)	SM					SM	
			APPLICABLE SUBPART				

AIRS/AFS Classification Codes:

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant which is below the 10 T/yr threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.

SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.

B = Actual and potential emissions below all applicable major source thresholds.

C = Class is unknown.

ND = Major source thresholds are not defined (e.g., radionuclides).

6. TIER II FEES

Fees apply to this facility in accordance with IDAPA 58.01.01.407. A fee assessment has been prepared for $10,000 as calculated in the Appendix C.

7. RECOMMENDATIONS

Based on the review of the application materials and all applicable state and federal regulations, staff recommends DEQ issue a proposed Tier II operating permit and permit to construct to the Interstate Group LLC. An opportunity for public comment on the air quality aspects of the proposed operating permit was provided in accordance with IDAPA 58.01.01.404.01.c.

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CC: Mike McGown, Boise Regional Office

APPENDIX A

MODELING REVIEW MEMORANDUM

MEMORANDUM

TO: Carole Zundel, Associate Air Quality Engineer, State Air Program Office

FROM: Rick Hardy, Modeling and Analysis Group, State Office of Technical Services RH

SUBJECT: Modeling Review for Interstate West Nampa, Idaho Facility

DATE: December 9, 2002

1. SUMMARY:

Interstate West Corporation (Interstate) submitted a Tier II Operating Permit application for its Nampa trailer assembly and finishing facility on February 26, 2001. Interstate was requested to demonstrate that criteria pollutant emissions from the facility would not cause or significantly contribute to a violation of an ambient air quality standard, as required by IDAPA 58.01.01.403.02.

The Idaho Department of Environmental Quality (DEQ) has reviewed and corrected the analyses and supporting materials submitted, and has verified that operation of the Nampa Facility as described in this application will satisfy the requirements of IDAPA 58.01.01.403.02.

2. DISCUSSION:

2.1 Introduction and Regulatory Requirements for Modeling

On November 13, 2000, Interstate submitted a letter describing their Nampa trailer manufacturing facility and providing estimates of material usage and VOC emissions. On August 14, 2001, DEQ sent an incompleteness letter, requesting additional information, to Interstate West. In response, Interstate submitted a Tier II Operating Permit application, dated February 26, 2002.

Per IDAPA 58.01.01.403, no Tier II operating permit can be granted unless the applicant demonstrates to the satisfaction of DEQ that emissions from the facility "would not cause or significantly contribute to a violation of any ambient air quality standard." Thus particulate matter emissions, and minor levels of nitrogen oxides (NOx), sulfur dioxide (SO_2), and carbon monoxide (CO) must be evaluated for comparison to the National Ambient Air Quality Standards (NAAQS). Potential lead (Pb) emissions were determined by DEQ to be negligible.

2.2 Applicable Air Quality Impact Limits and Required Analyses

The Interstate facility is located in Canyon County, which is designated as an attainment or unclassifiable area for all criteria pollutants. If estimated maximum ambient air impacts from the emissions sources at the facility exceed the "significant contribution" levels of IDAPA 58.01.01.006.93, then DEQ modeling guidance requires a full impact analysis. A full impact analysis for attainment area pollutants requires adding ambient impacts from facility-wide emissions to a DEQ-approved background concentration value that is appropriate for each criteria pollutant at the facility location. The resulting criteria pollutant concentration contributions to ambient air are then compared to the NAAQS listed in Table 1.

An ambient assessment of Toxic Air Pollutant (TAP) impacts was not performed for the facility to demonstrate compliance with IDAPA 58.01.01.161. DEQ determined that the magnitude and nature of TAP emissions and volatile organic carbon compound (VOC) emissions adequately demonstrated compliance with IDAPA 588.01.01.161.

Table 1. Applicable Regulatory Limits

Pollutant	Averaging Period	Regulatory Limit[a] ($\mu g/m^3$)[b]	Modeled Value Used[c]
Nitrogen dioxide (NO_2)	Annual	100[d]	Maximum 1st highest[e]
Sulfur dioxide (SO_2)	3-hour	1,300[f]	Maximum 2nd highest[e]
	24-hour	365[f]	Maximum 2nd highest[e]
	Annual	80[d]	Maximum 1st highest[e]
Carbon monoxide (CO)	1-hour	40,000[f]	Maximum 2nd highest[e]
	8-hour	10,000[f]	Maximum 2nd highest[e]
PM_{10}[g]	24-hour	150[f]	Maximum 6th highest[e]
	Annual	50[d]	Maximum 1st highest[e]
Lead (Pb)	Quarterly	1.5[d]	Maximum 1st highest[e]

a. IDAPA 58.01.01.577
b. Micrograms per cubic meter
c. When using five years of meteorological data
d. Not to be exceeded
e. Concentration at any modeled receptor using five years of meteorological data
f. Not to be exceeded more than once per year
g. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

2.3 Background Concentrations

Applicable background concentrations are shown in Table 2. Statewide background concentrations used for the Interstate modeling were developed by DEQ. Measured maximum PM10 is used for Nampa. "Urban values are used for sulfur dioxide due to the presence of significant industrial SO2 emissions. Values for nitrogen dioxide, lead and carbon monoxide were selected as small town/suburban due to the location of Interstate on the outskirts of Nampa.

Table 2. Background Concentrations

Pollutant	Averaging Period	Background Concentration[a] ($\mu g/m^3$)[b]
PM_{10}[c]	24-hour	103
	Annual	34.1
Nitrogen dioxide (NO_2)	Annual	32
Sulfur Dioxide (SO_2)	3-hour	120
	24-hour	40
	Annual	10
Lead (Pb)	Quarterly	0.08
Carbon Monoxide (CO)	1-hour	10,200
	8-hour	4,300

a. PM_{10} background concentrations were updated in July 2002.
b. Micrograms per cubic meter
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

2.4 Modeling Impact Assessment

The ambient air impact analysis was performed by Interstate's contractor, URS Corporation, using the screening level model, SCREEN3 – 1996 Version. A modeling protocol was not submitted to DEQ prior to the analysis. DEQ initially conducted verification modeling using SCREEN3 - Version 96043. At that time, the Interstate Tier II application indicated that the "outside painting area", in which undercoating is applied to trailer bottoms, involved a viscous undercoat material applied as large droplets with no fine spray. A subsequent visit suggested that some spray fines occurred during the undercoating process and that the undercoating now takes place in a high-bay three-sided room on the northwest corner of the smaller building. Revised emission rates were provided and the modeling reassessed. Since multiple sources with multiple large buildings are present, SCREEN3 was no longer appropriate, and the modeling review was completed using the ISC3-PRIME model.

Table 3 provides a summary of the modeling parameters used for the DEQ analysis.

Table 3. Modeling Parameters

Parameter	Description/Values	Documentation/Additional Description
Model	ISC3-PRIME	Version 99020
Meteorological data	Surface - Boise, Idaho Upper Air – Boise, Idaho	1987 – 1991 Files: BOI.MET
Model options	Regulatory Default	
Land use	Urban	Light Industrial/Commercial area
Terrain	Flat terrain	
Building downwash	Used building profile input program for PRIME (BPIP-PRIME)	Building dimensions obtained from plot plan submitted. Building Height approximated.
Receptor grids (See Figure 1)	Grid 1	25 meter spacing along site boundary out to 75 meters
	Grid 2	50 meter spacing out to 200 meters
Facility location (UTM)[a]	Easting	537.3554 kilometers
	Northing	4,826.0833 kilometers

[a] Universal Transverse Mercator

2.4.1 Modeling Protocol

A modeling protocol was not submitted to DEQ prior to the application.

2.4.2 Model Selection

The initial ambient air impact analysis was performed by URS Corporation using the model SCREEN3 - Version 96043. DEQ verification modeling was performed using ISC3-PRIME – Version 99020. ISC-Prime was used because of the close proximity of sources to large buildings and to the facility property line. This requires consideration of pollutant concentrations within building recirculation cavities. ISCST3 does not calculate pollutant concentrations within building recirculation cavities.

2.4.3 Meteorological Data

Surface meteorological data from the Boise, Idaho Airport, National Weather Service Station were used in the modeling analyses. These data were collected from 1987 through 1991. Mixing height data for the same time period were used, derived from upper air sounding data collected at the Boise National Weather Service Station.

2.4.4 Terrain Effects and Facility Layout

The modeling analyses submitted by URS did not consider elevated terrain. DEQ confirmed during a visit that the area within the modeling domain is relatively flat with respect to dispersion modeling

influences. DEQ also verified proper identification of the facility boundary and buildings on the site plan. Figure 1 shows the emission sources, buildings, and receptors included in the dispersion modeling analysis.

2.4.5 Building Downwash Effects

Plume downwash effects caused by structures present at the facility were accounted for in the modeling analysis. The Building Profile Input Program for ISC-PRIME (BPIP-PRIME) was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters.

2.4.6 Receptors

DEQ verification modeling was conducted using the following grid of ambient air receptors:

- Receptors every 25 meters along the boundary identifying the location of ambient air, extending out 75 meters from the ambient air boundary.
- Receptor spacing of 50 meters out 200 meters from the ambient air boundary.

2.4.7 Emissions Rates

Table 4 provides emissions quantities. Stack location, stack height, stack diameter, stack gas temperature, and stack gas flow rate were provided by URS. Maximum emissions rates are based on the maximum production rate of 2,000 trailer-feet per week. Modeling was conducted using 120% of maximum emissions rates shown in Table 4, to assure that 20% greater emissions levels than the maximum capacity would not cause an exceedance of the NAAQS.

Table 4. Emissions Quantities

Source	**Maximum Hourly Emissions Rate[a] pounds per hour (lb/hr)**		
Pollutant	**Paint Booth Exhaust [b]**	**Welding and Fugitives**	**Undercoat Painting**
Criteria Pollutants			
Particulate Matter 10 micrometers and less (PM_{10})	0.91	0.076	0.49
Nitrogen Oxides (NOx) (modeled as 100% NO_2)	0.13		
Sulfur Dioxide (SO_2)	0.001		
Lead (Pb)	Negligible		
Carbon Monoxide (CO)	0.11		
VOCs	18	3.1	8.6

a. Emissions rate used for 1-hour averaging periods. Modeling assumes 120% of these rates.
b. Paint Booth Exhaust includes paint VOCs, PM_{10} particulate matter and combustion gases.

2.4.8 Emissions Release Parameters

Table 5 provides emission release parameters. Stack location, stack height, stack diameter, stack gas temperature, and stack gas flow rate were provided by URS. Undercoating fugitive emissions were simulated using eight point sources arranged uniformly across the open bay door area at the north west corner of the smaller building, which also includes the "Wood Dept" as shown on the site plan. Point sources were used to assure that building wake effects were properly simulated with the Prime algorithm. Velocity, temperature, and "stack diameter" parameters were selected to assure that no significant plume rise is attributed to Undercoating emissions. Building dimensions were estimated against the scaled plot plan and the effect of buildings and tanks on plume downwash was included in the analysis.

Table 5. Emissions and Stack Parameters

Source	Source Type	Stack Height (m)[a]	Stack Diameter (m)	Stack Gas Temp. (K)[b]	Stack Gas Flow Velocity (m/sec)[c]
Paint Booth Exhaust	Point	11.6	0.91	293	12.1
Welding Exhaust [d]	Point	6.1	0.1	293	10.0
Undercoating Paint Area	8 points[e]	various[e]	1.0	293	0.001

a. Meters
b. Kelvin
c. Meters per second
d. Welding exhaust is assumed to exit the building at two "Weld Exhaust" points shown on site plan.
e. Undercoat painting fugitive emissions occur through a high bay opening. This source was simulated using 8 point sources uniformly distributed over the high bay opening.

A significant impact analysis was initially performed to determine if emissions from the facility would "significantly contribute" to pollutant concentrations in ambient air, as per IDAPA 58.01.01.006.93. A full impact analysis was then performed if emissions from the facility were estimated to have an ambient impact exceeding "significant contribution" levels. The full impact analysis involved modeling impacts from the facility's emissions and adding those impacts to background concentrations.

3. MODELING RESULTS:

3.1 Significant Impact Analysis Results

Modeled ambient air impact results from the significant impact analysis are provided in Table 6 for criteria pollutant emissions. Interstate West's SCREEN3 model results were used to assess significance of the facility's emissions. Because the potential ambient impact of the facility-wide emissions exceeds "significant contribution" levels for PM_{10}, a conservative, full impact analysis was performed for 24-hour and annual averaging times.

Table 6. Significant Impact Analysis for Criteria Pollutants (Facility-wide Emissions)

Pollutant	Averaging Period	Ambient concentration ($\mu g/m^3$)	Significant Contribution[a] ($\mu g/m^3$)	Full Impact Analysis Required (Y or N)
Particulate Matter 10 micrometers and less (PM_{10})	24-hour	32	5.0	Y
	Annual	9.4	1.0	Y
Nitrogen dioxide (NO_2)	Annual	0.35	1.0	N
Sulfur Dioxide (SO_2)	3-hour	0.03	25	N
	24-hour	0.013	5	N
	Annual	0.003	1	N
Lead (Pb)	Quarterly	N/A[b]	0.15	N
Carbon Monoxide (CO)	1-hour	3.7[c]	2,000	N
	8-hour	2.6[c]	500	N

a. Significant contribution level as per IDAPA 58.01.01.006.93
b. Impacts were not modeled because emissions are negligible
c. Maximum modeled value at any location

3.2 Full Impact Analysis Results

Results of the full impact analysis are presented in Table 7 and indicate that operation of the facility as described in the Tier II Permit Application will not cause or significantly contribute to a violation of an applicable NAAQS. These results conservatively reflect 120% of the maximum production rate of 2000 trailer-feet per week, based on a 40-hour work week. At the maximum production rate, the ambient impact of this facility would not result in an exceedance of the PM_{10} standard even if operated 24 hours per day at 120% of capacity.

Figure 2 depicts the annual average concentrations at each receptor and Figure 3 depicts the highest 6^{th}-high concentrations at each receptor for the 5 year modeling period. The maximum annual concentration during the five year modeling period occurred in 1987.

Table 7. Full Impact Analysis for Criteria Pollutants (Facility-wide Emissions)[c]

Pollutant	Averaging Period	Ambient Conc. ($\mu g/m^3$)[a]	Background Conc. ($\mu g/m^3$)	Total Ambient Conc. ($\mu g/m^3$)	Regulatory Limit[b] ($\mu g/m^3$)	Compliant (Y or N)
Particulate Matter 10 micrometers and less (PM_{10})	24-hour	38	103	141	150	Y
	Annual	13.1	34.1	47.2	50	Y

a. Concentration in micrograms per cubic meter
b. IDAPA 58.01.01.577
c. Based on 24-hour Operation at 120% of the maximum emissions rate corresponding to 2000 trailer-feet per week.

3.3 TAP Analysis Results.

As discussed in Section 2.2, an ambient assessment of Toxic Air Pollutant (TAP) impacts was not performed for the facility to demonstrate compliance with IDAPA 58.01.01.161. DEQ determined that the magnitude and nature of TAP emissions and volatile organic carbon compound (VOC) emissions adequately demonstrated compliance with IDAPA 588.01.01.161.

4. CONCLUSION

Review of materials submitted in the Tier II application, combined with DEQ's analyses, show to the satisfaction of DEQ that the modification would not cause or significantly contribute to a violation of any ambient air quality standard, as required by IDAPA58.01.01.203.02.

Electronic copies of the modeling analysis are saved on disk. Table 8 provides a summary of the files used in the modeling analysis. The permitting engineer has reviewed this modeling memo to ensure consistency with the PTC and technical memorandum.

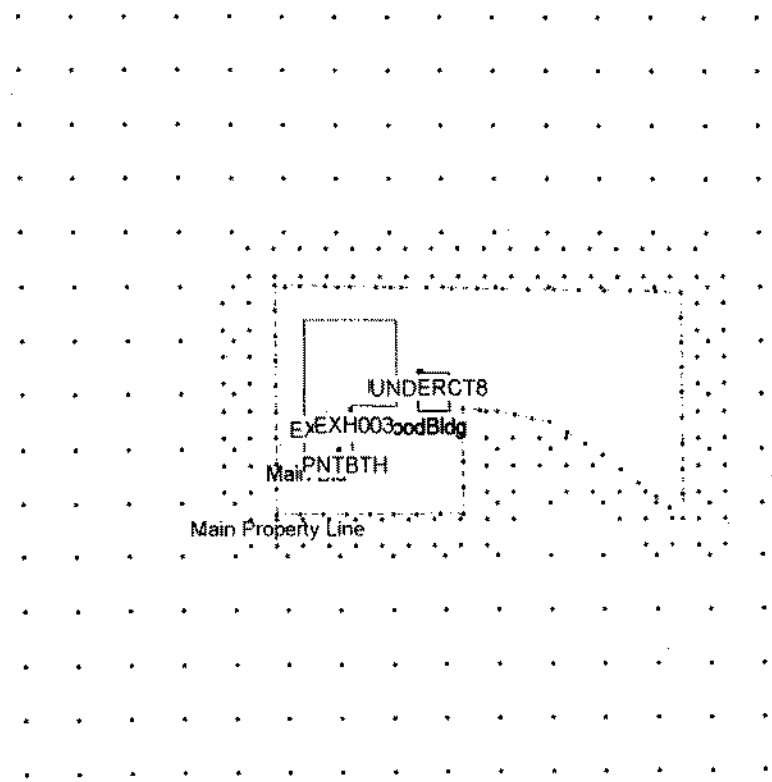
Table 9. Dispersion Modeling Files

Type of File	Description	File Name
Met data	Boise NWS data, 1987 – 1991	BOI87_91.MET
BEEST input files	SCREEN3 analysis of Paint Booth emissions	Hard copy, Appendix B of Permit Application Report
	24-hour PM_{10} run, full impact analysis and Annual PM_{10} run, full impact analysis	Interstate 3 Sources.BST

Each BST file has the following type of files associated with it:	
Input file for BPIP program	.PIP
BPIP output file	.TAB
Concise BPIP output file	.SUM
BEE-Line file containing direction specific building dimensions	.SO
ISCST3 input file for each pollutant	.DTA
ISCST3 output list file for each pollutant	.LST
User summary output file for each pollutant	.USF
Master graphics output file for each pollutant	.GRF
Some modeling files have the following type of graphics files associated with them:	
Surfer data file	.DAT
Surfer boundary file	.BLN
Surfer post file containing source locations	.TXT
Surfer plot file	.SRF

RH: G:\Technical Services\Modeling\Hardy\Interstate West\Interstate West Modeling Memo-12-09.doc

Figure 1 Facility, Sources and Receptors - Interstate West

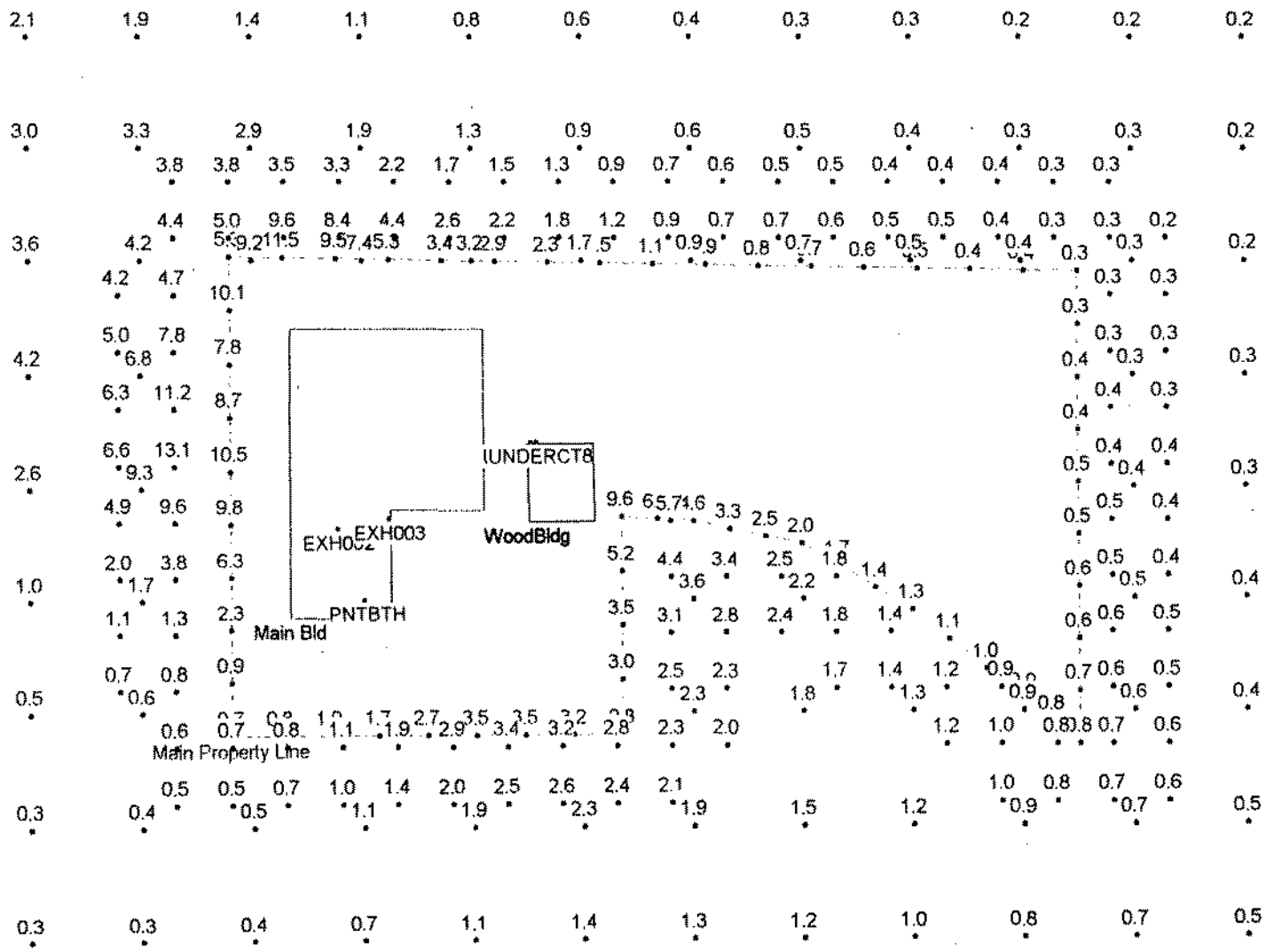


Interstate West - 3 Sources @ 120pct_12-09 C:\Projects\Interstate\Interstate 3 Sources.BST Scale: 1" = 179.2 Meters

Figure 2 Maximum Annual PM10 Modeled Concentration - 1987

Interstate West - 3 Sources @ 120pct_12-09

C:\Projects\Interstate\Interstate 3 Sources_87_PM10.GRF



Scale: 1" = 76.4 Meters

ANNUAL VALUES FOR GROUP: ALL

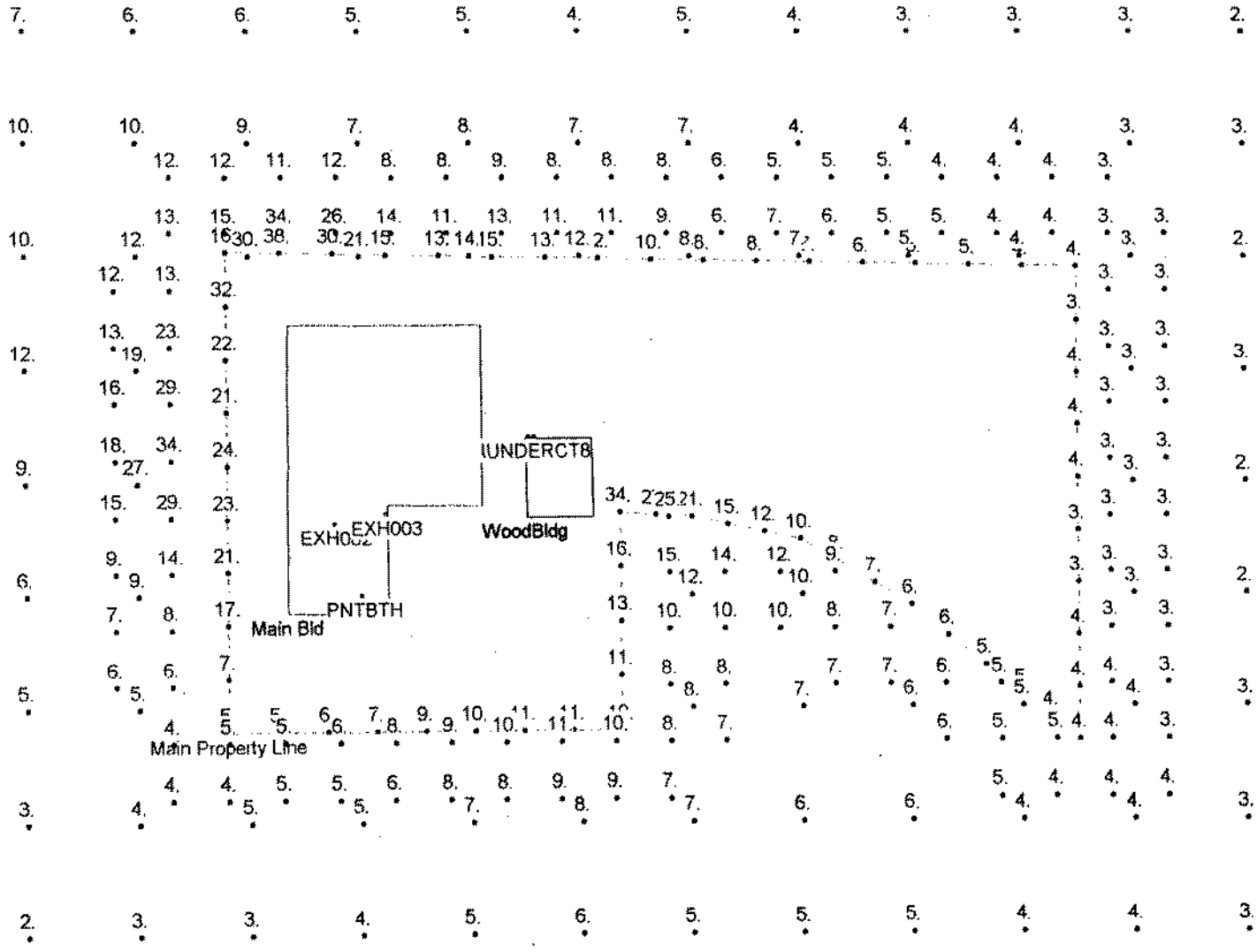
(before adding 34.1 ug/m3 background concentration)

Max = 13.12685 (15, 160)

Figure 3 High 6th-High 24-hr PM10 Modeled Concentration

Interstate West - 3 Sources @ 120pct_12-09

C:\Projects\Interstate\Interstate 3 Sources_87_PM10.GRF



Scale: 1" = 75.9 Meters

HIGH 6TH HIGH 24-HR VALUES FOR GROUP: ALL

Based on 5 years of modeling, 1987 - 1991

Max = 38.11766 (64.1, 251.4)

APPENDIX B

EMISSION FACTOR TO ESTIMATE TRANSFER EFFICIENCY

Emission Factor to Estimate Transfer Efficiency

Table III - SPRAY COATING OPERATIONS - DETERMINATION OF TRANSFER EFFICIENCY			
	% OVERSPRAY		
YPE OF SPRAY GUN	FLAT SURFACES	TABLE LEG SURFACES	BIRD CAGE SURFACES
Conventional	50	85	90
Airless	20-25	90	90
Electrostatic			
Disc	5	5-10	5-10
Airless	20	30	30
Air Atomized	25	35	35
HVLP	20	35	35
Equation to calculate transfer efficiency (TE) = (1 - % overspray / 100)			

Last Updated on 6/2/00

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AQMD Home Page

Previous Page

Last Update: 06/06/2000

By mohan balagopalan@toxics@ssc

URL: http://www.aqmd.gov/permit/te.html

APPENDIX C

TIER II FEE CALCULATION

Tier II Fee Calculation

Instructions:
Insert the following information and answer the following questions either Y or N. Insert the permitted emissions in tons per year into the table. TAPS only apply when the Tier II is being used for New Source Review.

Company: Interstate Group, LLC
Address: 224 Carnation Drive
City: Nampa
State: ID
Zip Code: 83687
Facility Contact: Shawn Luteyn
Title: Chief Operations Manager
AIRS No.: 027-00084

N	Did this permit meet the requirements of IDAPA 58.01.01.407.02 for a fee exemption Y/N?
N	Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N
Y	Is this a syntheric minor permit? Y/N

Emissions Inventory	Permitted Emissions (T/yr)
NO_x	0.6
PM10	1.1
PM	1.1
SO_2	0.0
CO	0.5
VOC	35.6
HAPS/TAPS	18.0
Total:	56.8
Fee Due	$ 10,000.00

Comments: NO_x, SO_2, and CO do not have limits. These values are taken from the emissions inventory section of the permit. The fee due is not changed by including these emissions.